



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/607,380 | 06/27/2003 | Toshiyuki Miyamoto | 50212-512 | 5140 |

20277 7590 02/13/2007
MCDERMOTT WILL & EMERY LLP
600 13TH STREET, N.W.
WASHINGTON, DC 20005-3096

| |
|----------|
| EXAMINER |
|----------|

HUGHES, DEANDRA M

| | |
|----------|--------------|
| ART UNIT | PAPER NUMBER |
|----------|--------------|

3663

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
|--|------------|---------------|
| 3 MONTHS | 02/13/2007 | PAPER |

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/607,380

Applicant(s)

MIYAMOTO ET AL.

Examiner

Deandra M. Hughes

Art Unit

3663

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 December 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 20-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 20-21, 23-31 is/are rejected.
- 7) ☒ Claim(s) 22 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 12/26/06 have been fully considered but they are not persuasive.

Applicant argues the following.

- (A) "The Office Action provides no evidence or reasoning to back up the assertion that the claimed invention is not enabled for optical frequency spacing of more than 4,680 GHz." (pg. 7, lines 11-13)
- (B) "Akasaka's 2.5 THz refers to wavelength spacing of the pumping channels, and does not teach or disclose the optical frequency spacing of the signal channel." (pg. 8, lines 9-11; *emphasis original*).
- (C) "...as illustrated in Fig. 19 of the Applicant's specification, each signal channel is not located at the peak or Raman gain spectrum due to each pumping channel, and is located in the wavelength range where the peaks and troughs of the Raman gain are." (pg. 9, lines 7-9)
- (D) "Applicant's traverse the Office Action's assertion of inherency regarding Raman amplification" because "the assertion of inherency in the Office Action lacks adequate basis in fact and/or technical reasoning, and is traversed by the Applicants." (pg. 9, 2nd paragraph)
- (E) "...Akasaka does not teach or suggest 'an optical frequency spacing between the adjacent pumping channels in the Raman amplification pumping light is not less than 4680 GHz' as is required by claim 23." (pg. 9, 3rd paragraph).

Argument (A) is unpersuasive because the Examiner provided reasoning to back up the assertion that the claimed invention is not enabled for optical frequency spacing of more than 4,680 GHz, namely 10,000 GHz. Applicant has failed to address the Examiner's reasoning. If, in fact, Applicant's invention is enabled for optical frequency spacing of 10,000 GHz, then Applicant may overcome the Examiner's rejection by

Art Unit: 3663

merely pointing to that portion of the specification that enables a frequency such as 10,000 GHz.

Argument (B) is unpersuasive because, as is abundantly well known in the art, Raman signal channels are pump channels and vice versa. It all depends upon how one defines the relative Stokes shift. Further, this is clearly disclosed by Akasaka (e.g., figs. 14, 16; col. 1, lines 45-65).

Arguments (C) and (D) are unpersuasive because the Examiner considers Raman amplifiers to inherently Raman amplify. The claimed limitation is merely a recitation of the Raman amplification process, which is further disclosed by Fig. 14. The Examiner referenced Figure 14 in the previous office action (dated 7/25/06; pg. 3, claim 23). However, Applicant has failed to distinguish the instant invention from Fig. 14 of Akasaka.

Argument (E) is unpersuasive because the Examiner addressed the claim limitation of "4,680 GHz or more" in the previous Office Action (dated 7/25/06). Applicant has since amended the language to read "not less than 4680 GHz". A frequency that is "not less than 4680 GHz" must be "4,680 GHz or more". Since the claim limitation has been met and Applicant has failed to distinguish the prior art from the instant invention, the argument is not convincing.

Claim Rejections - 35 USC § 112

2. Claims 23-29 rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for 4,680 GHz, does not reasonably provide enablement for optical frequency spacing of more than 4,680 GHz, e.g., 10,000 GHz.

Art Unit: 3663

The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make or use the invention commensurate in scope with these claims.

Claim Rejections - 35 USC § 102

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 20, 23, 25, and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Akasaka (US 6,292,288 published Sept. 18, 2001).

With regard to claim 20, Akasaka discloses:

- a transmitter (col. 14, line 12) transmitting widely spaced channel light with an optical frequency spacing of 2.5 THz (fig. 63; col. 12, lines 45-50);
- an optical fiber transmission line transmitting the signal light (col. 14, line 12);
- an optical fiber for Raman amplification constituting at least part of said optical fiber transmission line (col. 14, lines 10-11; see also fig. 1, #2);
- SRS means which Raman amplifiers the signal light in said optical fiber for Raman amplification, by supplying Raman amplification pumping light (col. 3, lines 37-38; see also fig. 1, #1);
- wherein the Raman amplification pumping light includes a plurality of pump channels (e.g. fig. 16, each central wavelength is a different pumping channel) the plurality of pumping channels are assigned to the

same part of said optical transmission line (the pump module , #1, of fig. 1 is multiplexed into the fiber via #13).

With regard to claim 23, Akasaka discloses:

- an optical frequency of each pumping channel contained in the pumping light is so set as to locate a peak of Raman gain at an optical frequency different from an optical frequency of each signal channel contained in the signal light (this is inherent to Raman amplification; further, it is disclosed by Akasaka in fig. 14);
- wherein an optical frequency spacing between adjacent pumping channels in the Raman amplification is 6nm (fig. 12).

With regard to claim 25, fig. 48 discloses negative dispersion transmission line.

With regard to claim 30, Akasaka discloses that at least one of the pumping channels in the Raman amplification pumping light contains a plurality of longitudinal modes (col. 4, lines 65-68).

Claim Rejections - 35 USC § 103

5. Claims 21, 24, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akasaka (US 6,292,288 published Sept. 18, 2001) in view of Avallone (US2005/0117839 filed Dec. 27, 2001)

Akasaka does not specifically disclose that the transmitter comprises a directly modulated laser. However, Avallone teaches directly modulated laser transmission signals (paragraph [0086]). It would have been obvious to one of ordinary skill in the art (e.g. an optical engineer) at the time the invention was made to directly modulated the

transmission signal for the advantage of superimposing a traffic signal, as is specifically taught by Avallone in paragraph [0086].

Allowable Subject Matter

6. Claims 22 and 26-29 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims and if the 112-1st rejection outlined above is overcome.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

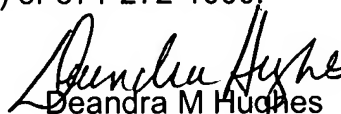
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Deandra M. Hughes whose telephone number is 571-272-6982. The examiner can normally be reached on M-F, 8:30am-5:00pm.

Art Unit: 3663

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on 571-272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Deandra M Hughes
Primary Examiner
Art Unit 3663